

From: <https://www.hcn.org/articles/when-our-river-turned-orange-animas-river-spill>

(NEWS STORY)

• **Pollution in the Animas is not new:** The Upper Animas River watershed consists of three main streams, the Animas, Cement Creek and Mineral Creek all of which drain the Silverton Caldera, the highly mineralized collapsed core of an ancient volcano, and which run together at Silverton. Miners started going after the minerals in the 1870s, and the river's been the victim of their pollution ever since. Mines simply poured their tailings directly into the creeks and rivers until, in the 1930s, downstream farmers got them to stop; the remnants of those releases can still be found under the river bed in Durango and beyond. Then there's acid mine drainage. The portals and shafts blasted into the mountainsides hijack the natural hydrology, pulling water flowing through fractures toward natural springs into the mine tunnels. There, the water reacts with iron disulfide (pyrite) and oxygen to form sulfuric acid. The acidic water dissolves naturally occurring heavy metals such as zinc, lead, cadmium, copper and aluminum. The resulting contaminated water flows out of the mine adit as if from a spring. By 1991, when the last major mine in the watershed shut down, there were some 400 mines in the watershed, many discharging unmitigated discharges into streams. Not a fish could be found for miles downstream from Silverton, and the impacts to aquatic life were felt in Durango, where, when the mines were still running, sensitive fish were unable to reproduce.

• **Superfund has long been on the table, and long been swept off:** As mining waned in the late 1980s, federal and state regulatory agencies started looking at how to clean up the mess. Superfund, which comes with a big pile of cash, seemed like the obvious approach. But locals feared that the stigma would destroy tourism along with any possibility of mining's return. Besides, Superfund can be blunt; the complex Animas situation demanded a more surgical, locally-based approach. So the Animas River Stakeholders Group, a collaboration between concerned citizens and representatives from industry and federal and state agencies, was created in 1994 to address the situation. The approach was successful, at first, but then water quality began deteriorating again. The specter of Superfund returned. Many locals, worried about impacts to property values and tourism, have again resisted. Sunnyside Gold Corp. (see below) has offered millions of dollars to further cleanup efforts -- as long as there's no Superfund designation.

• **The problem is massive and complex, but not hopeless:** In 1991, the last big mine in the region, the Sunnyside, shut down. Its owner, Sunnyside Gold Corp., planned to plug the American Tunnel, thus stanching the flow of acid mine drainage (which it ran through a water treatment plant), and then walk away. The state wouldn't allow it: While a plug, or bulkhead, would be a short-term fix, in the long-term the water, and its contaminants, might back up in the mine and find another way to the surface. So Sunnyside agreed not only to bulkhead its mine, but also to clean up abandoned mines nearby -- a sort of pollution offset project -- while continuing to run the waters of upper Cement Creek through a water treatment facility. That, combined with the ARSG's extensive efforts, worked: By the early 2000s, zinc, cadmium and lead levels in Mineral Creek had dropped by 50 to 75 percent, and water quality in the Upper Animas had improved significantly (Cement Creek had never supported fish, and never will). Fish appeared just below Silverton, where they hadn't been seen in probably a century. It was success, without Superfund.

• **Then it got even more complex:** Sunnyside cut a deal with the state and Gold King mining, a small operation owned by a Silvertonian. Sunnyside would leave, and turn over its water treatment operations to Gold King, along with enough cash to keep it running for a while. Gold King hoped to eventually resume mining the Gold King (not far from the American Tunnel). For decades, the Gold King, like the nearby Red and Bonita mine, had not discharged any water. But not long after Sunnyside sealed its bulkheads, water started pouring out of all of them. "It was not a coincidence," says Peter Butler, ARSG co-coordinator. The backed up water had found natural fractures to follow into the other mines. Together, the Gold King and Red and Bonita would become some of the biggest polluters in the basin. Initially, their waters were run through the treatment plant that Sunnyside had left behind. But before long, Gold King ran into technical, financial and legal troubles and the treatment plant stopped operating. Water quality for miles downstream once again deteriorated. The fish that had returned to the Animas below Silverton were wiped out. Part of the renewed impetus for a Superfund designation was to bring in funds to resume water treatment as well as figure out ways to clean up the basin's remaining major polluting mines.

• **In the meantime, a piecemeal approach continues:** The ARSG, along with federal and state agencies, continue to do what they can to clean up mines. In some cases, this means plugging them, which is what the EPA is working on at the Red and Bonita, and planned to do at the Gold King, when the dam broke. Other methods include diverting water before it gets into the mine in the first place, and removing waste piles at the entrances to mines so that acidic discharge from the mine can't leech minerals out of the rock. Until the Gold King is plugged, it will continue to discharge acid mine drainage, just as it had before the spill.

• **This isn't the first time that something like this has happened, nor is it the worst:** In June of 1975, a huge tailings pile on the banks of the Animas River northeast of Silverton was breached, dumping tens of thousands of gallons of water, along with 50,000 tons of heavy-metal-loaded tailings into the Animas. For 100 miles downstream, the river "looked like aluminum paint," according to a *Durango Herald* reporter at the time; fish placed in a cage in the water in Durango all died within 24 hours. It was just one of many breaches of various magnitude. Just a decade before, the same tailings pile was found to be spilling cyanide-laced water into the river. In 1978, after the Sunnyside Mine workings got too close to the floor of Lake Emma, the lake burst through, sending an estimated 500 million gallons of water tearing through the mines, sweeping up huge machinery, tailings and sludge, and blasting it out the American Tunnel and sending it downstream. No one was working in the mine at the time, which is either miraculous, or suspicious, depending on who you ask.

From: <http://www.animasriverstakeholdersgroup.org/>

(Animas River Stakeholders Group website)

The Upper Animas Watershed has a long history of extensive metal mining as an economic mainstay dating back to the 1870's. There are hundreds of abandoned and inactive mine sites in the region. Major mining operations ended in 1991. Part of the mining legacy is metal loading to alpine streams and creeks

in addition to the natural metal loading already occurring in this mineralized area.

ARSG began in 1994 as an alternative process to determining appropriate water quality standards for the Upper Animas River Basin. In 1995, the Colorado Water Quality Control Commission adopted strict, perhaps unachievable water quality standards for certain segments of the Upper Animas, but delayed the effective date to allow ARSG to come up with a plan to improve water quality. The commission tasked ARSG to locate and evaluate sources of metals contamination, determine potential improvement and prioritize sites for remediation in order to recommend achievable water quality standards and use classifications.

In addition, U.S. EPA was contemplating a Superfund designation of whole Upper Basin. Most of the Stakeholders thought that such a designation would lead to lots of litigation, reduced property values, distrust, and resources going to attorneys and consultants as opposed to on the ground projects that might improve water quality.

The Stakeholders process involves the extensive collection, consolidation, and analysis of chemical, physical and biological components necessary to assess the impacts of contamination on aquatic life and habitat throughout the basin. Using a watershed approach, ARSG has developed a remediation plan, recommended feasible water quality standards (which were adopted in 2001) and implemented remediation projects throughout the Upper Animas River Basin.

From: <http://www2.epa.gov/region8/upper-animas-mining-district>

<http://www2.epa.gov/region8/upper-animas-mining-district-red-and-bonita-mine-removal>

(EPA Region 8 Website)

Site Description

The site study area includes mining-impacted land and surface water in the UA watershed in San Juan County, Colorado, including private, federal and state lands, as well as the town of Silverton. Since investigations are still underway, the areas that comprise the site are still being defined. Initial investigations document elevated levels of hazardous substances (heavy metals) in and around the many former mining sites, as well as in surface water and sediments in the UA. The sources for these heavy metals are both man-made (i.e., mining related) and naturally occurring.

In this area, several calderas (collapsed craters of ancient volcanos) are the remnants of eruptions 27-28 million years ago. During this volcanic activity, many faults developed in the rocks. Mineral-laden water deposited metals, such as gold, silver, lead, zinc and copper, in these faults. These faults became the ore veins that were later mined.

The UA watershed covers approximately 140 square miles of one of the volcanic calderas, the Silverton caldera, which in its natural state is highly mineralized. Active mining in and around Silverton started around 1870 and ended in 1991. Over 300 former mines have been identified in the area. Mining activities significantly increased the exposure of mineralized geologic materials. This contributes to degraded water quality in the UA and its tributaries. Mine drainage from the former mines and mine-related wastes, such waste rock piles, contribute acidic, metal-

rich water to the UA.

Background

EPA and the Colorado Department of Public Health and Environment (CDPHE) conducted a Superfund Site Assessment of the site in the 1990s. This assessment identified the severe impacts to aquatic life in the UA and its tributaries from naturally occurring and mining-related heavy metals. It also acknowledged the community-based collaborative effort that was under way at that time to address those impacts. In recognition of the community-based collaborative effort, EPA agreed to postpone adding all or a portion of the site to the Superfund National Priorities List (NPL), as long as progress was being made to improve the water quality of the Animas River.

In support of the collaborative effort, EPA's Superfund Remedial program has contributed resources for water quality sampling, ecological risk assessment and data analysis. In addition, the Superfund Removal program has contributed resources for the investigation and closure (bulkheading) of the Red and Bonita Mine tunnel.

EPA, through its Ecosystem Protection program, also provides the Colorado Water Quality Division of CDPHE with Nonpoint Source Management program (Section 319) grant funds. ARSG and others have received grants under that program for investigation and cleanup efforts in the watershed.

Until approximately 2005, water quality in the Animas River was improving. However, since 2005, water quality in the Animas River has not improved and, for at least 20 miles below the confluence with Cement Creek, has declined significantly.

Because of this declining water quality in the Animas River, in 2008, EPA's Superfund Site Assessment program began investigations in Upper Cement Creek focused on evaluating whether the Upper Cement Creek area alone would qualify for inclusion on the NPL. This evaluation indicated that the area would qualify, although after receiving additional community input, EPA again postponed efforts to include the area on the NPL. Since that time, EPA has continued and broadened its investigations of conditions at the site in order to understand the major sources of heavy metal contamination in the UA.

In 2015, EPA's Superfund Remedial program is continuing field investigations at the Upper Animas Mining District site. These investigations include collecting surface water samples during high-flow conditions in June as well as surface water and sediment samples during low-flow conditions in September/October. Both water and sediment samples will be tested for a range of contaminants including heavy metals associated with historic mining activities. EPA also plans to sample mine waste areas in the upper reaches of the Upper Animas River (UA) watershed and the tailings along the UA between Howardsville and Eureka upstream of Silverton in early August.

On June 23, 2015, EPA met with the Silverton Town Board and San Juan County Commissioners to discuss a number of site-related issues including the possible sampling of community soils. During the meeting, EPA discussed historical information about smelting operations in or near town (see [smelter map](#)). EPA also discussed very limited residential soil sampling conducted by the state on behalf of EPA in 1997 (see [Draft Analytical Results Report](#))

and data from the Rose/Walsh Smelter Brownfields investigation. All of these data offer insights into the potential for elevated levels of heavy metals in or near town, but are insufficient to draw any firm conclusion regarding the issue. EPA also offered options for cleaning up properties, if levels of heavy metals in the soil pose a potential human health concern.

EPA released a draft Baseline Ecological Risk Assessment (BERA) for the portion of the site that includes Upper Cement Creek in April 2015. EPA presented the document and related findings to the community and to the Animas River Stakeholder Group (ARSG) during meetings in Silverton on April 28, 2015.

EPA's Superfund Removal program will be installing an engineered concrete bulkhead (large plug) in the adit (tunnel) of the Red and Bonita Mine during summer 2015. The bulkhead will help control the ongoing release of contaminated water from the adit.